REMARKS/ARGUMENTS

1.   Claims 1-36 are Patentable Over the Cited Art

The Examiner rejected claims 1-35 as anticipated (35 U.S.C. §102(b)) by Tsushima (U.S. Patent No. 6,044,450). Applicants traverse.

Claims 1, 13, and 24 require: accessing a program comprising a plurality of instructions including at least one no operation (NOP) instruction; determining one instruction in the program preceding a determined NOP instruction whose movement forward to replace the determined NOP instruction will not result in data not being available when needed; and replacing the determined NOP instruction with the determined instruction preceding the determined NOP instruction.

The Examiner cited FIGs. 9-10 and col. 10, lines 14-16 and 35-45 of Tsushima as disclosing the claim requirement of determining one instruction in the program preceding a determined NOP instruction whose movement forward to replace the determined NOP instruction will not result in data not being available when needed. (Third Office Action, pg. 3). Applicants traverse.

The cited FIGs. 9-10 show FORTRAN program statements.   The cited col. 10 mentions that the first to fourth instructions in FIG. 9 are executed by the first to sixth very long instruction word (VLIW) instructions in FIG. 10.   The cited col. 10 further mentions an NOP number sub-field and that the number of succeeding NOP instructions can be set to one NOP number sub field and all succeeding NOP instructions can be deleted.   Tsushima mentions that the NOP sub field is set with the number of NOP instructions to be used, after execution of this small instruction and before execution of a next valid instruction. (col. 7, lines 30-40)

The cited col. 10 further mentions that if the number of succeeding NOP instructions is 8 or larger, a value of 7 is set n the NOP number sub-field, and seven NOP instructions among succeeding NOP instructions are deleted. The remaining NOP instructions are not deleted. The cited col. 10 discusses how to delete NOP instructions using a NOP number sub field indicating a number of NOP instructions to be used.

Nowhere is there any disclosure or mention in the cited col. 10 of the claim requirement of determining one instruction in the program preceding a determined NOP instruction whose movement forward to replace the determined NOP instruction will not result in data not being

available when needed. Instead, the cited col. 10 discusses how to delete NOP instructions based on an NOP sub-field indicating a number of NOP instructions to maintain, and deleting those succeeding NOP instructions. There is no disclosure of determining an instruction preceding a determined NOP instruction that can be moved forward to replace a determined NOP instruction. There is no disclosure or mention of moving an instruction forward to replace an NOP instruction.

The Examiner cited FIG. 11 and col. 10, lines 26-27 of Tsushima as disclosing the claim requirement of replacing the determined NOP instruction with the determined instruction preceding the determined NOP instruction. (Third Office Action, pg. 3) Applicants traverse.

The cited FIG. 11 shows a series of VLIW instructions obtained by time compressing the VLIW instructions in FIG. 10. (Tsushima, col. 10, lines 19-24) The cited col. 10 mentions that the number of NOP instructions after each small instruction is set to the NOP number sub field and succeeding NOP instructions are deleted to obtain VLIW instruction in FIG. 11.

Nowhere does the cited col. 10 disclose or mention replacing an NOP instruction with a determined instruction preceding the determined NOP instruction, such that moving the instruction forward will not result in data not being available when needed. Instead, the cited col. 10 mentions deleting NOP instructions based on an NOP number sub field, but does not disclose replacing an NOP instruction by moving a preceding determined instruction forward to replace the NOP instruction.

Applicants submit that the Examiner has not cited any part of Tsushima that discloses or mentions determining an instruction preceding an NOP instruction to move forward to replace the NOP instruction, where the movement forward will not result in data not being available when needed.

Accordingly, claims 1, 13, and 24 are patentable over the cited art because the cited Tsushima does not disclose all the claim requirements.

Claims 2-12, 14-23 and 25-34 are patentable over the cited art because they depend from one of claims 1, 13, and 34. Further, the below discussed claims provide additional grounds of patentability over the cited art.

Claims 3, 15, and 26 depend from claims 1, 13, and 24, respectively, and further require deleting at least one instruction in the program that is not needed to provide the processing delay to ensure the data is available to at least one dependent instruction; and after deleting the at least

one instruction, replacing at least one NOP instruction with one determined instruction whose movement forward to replace the determined NOP instruction will not result in data not being available when needed.

The Examiner cited the above discussed col. 10, lines 26-27 of Tsushima as disclosing the claim requirement of after deleting the at least one instruction, replacing at least one NOP instruction with one determined instruction whose movement forward to replace the determined NOP instruction will not result in data not being available when needed. (Third Office Action, pg. 4)   Applicants traverse.

The cited col. 10 mentions that the number of NOP instructions after each small instruction is set to the NOP number sub field and succeeding NOP instructions are deleted to obtain the VLIW instruction in FIG. 11.

This cited col. 10 does not disclose that after deleting one instruction not needed to provide the processing delay, at least one NOP instruction is replaced with a determined preceding instruction. Instead, the cited col. 10 discusses how to delete NOP instructions, and does not disclose moving one instruction forward to replace an NOP instruction after deleting at least one instruction not need to provide the processing delay.

Accordingly, claims 3, 15, and 26 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Tsushima.

Claims 6, 18, and 29 depend from claims 2, 14, and 25 and additionally require that deleting NOP instructions in the program further comprises accessing and processing each NOP instruction by: determining whether the accessed NOP instruction is needed to delay processing of one dependent instruction following the accessed NOP instruction to ensure that data is available to the dependent instruction accessing the data; and deleting the accessed NOP instruction in response to determining that the NOP instruction is not needed to ensure that data is available to the dependent instruction accessing the data..

The Examiner cited col. 10, lines 35-45 of Tsushima as disclosing these claim requirements. (Third Office Action, pg. 5)   Applicants traverse.

The cited col. 10 mentions an NOP number sub-field indicating a number of NOP instructions and that the number of succeeding NOP instructions can be set to one NOP number sub field and all succeeding NOP instructions can be deleted.   If the number of succeeding NOP

instructions is 8 or larger, a value of 7 is set to the NOP number sub-field, and seven NOP instructions among succeeding NOP instructions are deleted. The remaining NOP instructions are not deleted. Tsushima mentions that the NOP sub field is set with the number of NOP instructions to be used, after execution of this small instruction and before execution of a next valid instruction. (col. 7, lines 30-40)

The cited col. 10 discusses how to delete NOP instructions using an NOP number sub field indicating a number of NOP instructions to be used. Nowhere is there any disclosure or mention of the claim requirement of accessing and processing each NOP instruction by: determining whether the accessed NOP instruction is needed to delay processing of one dependent instruction following the accessed NOP instruction to ensure that data is available to the dependent instruction accessing the data. Instead, the cited Tsushima discusses using an NOP number sub field indicating the number of NOP instructions to use, such that succeeding NOP instructions are deleted. There is no disclosure of determining whether an NOP instruction is needed to delay processing of one dependent instruction.

Accordingly, claims 6, 18, and 29 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Tsushima.

Claims 8, 20, and 31 depend from claims 1, 13, and 24, respectively, and further require that the determining of one instruction in the program to move forward comprises determining one instruction whose movement forward to replace the determined NOP instruction will not result in data not being available to one dependent instruction following the NOP instruction.

The Examiner cited col. 10, lines 35-45 of Tsushima as disclosing the requirements of these claims. (Third Office Action, pg. 7)

As discussed, the cited col. 10 discusses how to delete NOP instructions using a NOP number sub field indicating a number of NOP instructions to be used. Nowhere is there any disclosure or mention of the claim requirement of a determination of an instruction to move forward whose movement forward will not result in data not being available to one dependent instruction following the NOP instruction. Instead, the cited Tsushima discuss using an NOP number sub field indicating the number of NOP instructions to use and deleting succeeding NOP instructions. Accordingly, claims 8, 20, and 31 provide additional grounds of patentability over

the cited art because the additional requirements of these claims are not taught in the cited Tsushima.

Claims 10, 22, and 33 depend from claims 8, 20, and 31 and further require deleting at least one NOP instruction not needed to ensure that data accessed by the dependent instruction is available to the dependent instruction, wherein the operations of replacing accessed NOP instructions with previous non-NOP instructions are performed after deleting NOP instructions not needed to ensure that data accessed by the dependent instruction is available.

The Examiner cited the above discussed col. 10, lines 35-45 of Tsushima as disclosing the additional requirements of these claims. (Third Office Action, pgs. 8) Applicants traverse.

As discussed, the cited col. 10 discusses how to delete NOP instructions using a NOP number sub field indicating a number of NOP instructions to be used. Nowhere is there any disclosure or mention of the claim requirement of after deleting an NOP instruction, the NOP instruction is replaced with the determined instruction whose movement forward will not result in data not being available when needed.

Accordingly, claims 10, 22, and 33 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not taught or suggested in the cited Tsushima.

Claim 36 depends on claim 1and further recites that determining one instruction in the program preceding the determined NOP instruction whose movement forward to replace the determined NOP instruction will not result in data not being available when needed comprises determining whether the instruction to move forward causes the data needed by one dependent instruction to be written in fewer cycles such that the number of cycles between a writing instruction and the dependent instruction are not sufficient to guarantee that the written data will be available to the dependent instruction.

The Examiner cited the above discussed col. 10 as disclosing the requirements of claim 36. (Third Office Action, pg. 9) Applicants traverse.

As discussed, the cited col. 10 discusses how to delete NOP instructions using an NOP number sub field indicating a number of NOP instructions to be used. However, nowhere does the cited col. 10 disclose or mention determining an instruction in the program to move forward preceding the NOP instruction to replace by determining whether the instruction to move forward causes the data needed by one dependent instruction to be written in fewer cycles such

that the number of cycles between a writing instruction and the dependent instruction are not sufficient to guarantee that the written data will be available to the dependent instruction. There is no mention in the cited Tsushima of moving one instruction forward to replace an NOP instruction and making the claimed determination when deciding whether to move the instruction forward.

Accordingly, claim 36 provides additional grounds of patentability over the cited art because the additional requirements of these claims are not taught or suggested in the cited Tsushima.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-36 are patentable. Should any additional fees be required beyond those paid, please charge Deposit Account No. 50-0585.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

Dated: July 9, 2008   By:_____/David Victor/_____

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